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Glycaemic Trajectories Following a Long-Term Yoga and Lifestyle Intervention in Adults with Type 2 Diabetes Mellitus: A Single-Arm Observational Cohort Study with 21-Month Follow-Up

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Abstract: ***Background:*** *Yoga-based lifestyle interventions are widely practised in India as a complementary strategy for type 2 diabetes mellitus (T2DM). While short-duration trial evidence supports modest glycaemic benefit, real-world data on the trajectories of fasting and postprandial glycaemia across extended follow-up are limited.*
Aim: *To describe the longitudinal trajectories of fasting blood glucose (FBG) and postprandial blood glucose (PPBG) in a cohort of adults with T2DM enrolled in a yoga-based lifestyle intervention with quarterly assessments over 21 months.*
Methods: *This is a prospective, single-arm, observational cohort study. Adults with T2DM (n = 99; 71 women, 28 men; mean age 45.6 ± 8.6 years) were enrolled and underwent eight quarterly assessments from August 2024 to April 2026. The intervention combined an intensive yoga camp with periodic reinforcement sessions and a structured low-carbohydrate, high-protein dietary plan. FBG and PPBG were measured at each visit. Statistical analyses included paired comparisons (paired t-test and Wilcoxon signed-rank test), linear mixed-effects models with random intercepts per participant, and pre-specified subgroup analyses by terminal medication status.*
Results: *Mean FBG declined from 160.9 ± 59.8 mg/dL at baseline to 102.9 ± 36.5 mg/dL at month 21 (mean change −58.0 mg/dL; paired $t = -21.5$, $p < 0.001$; Cohen's $d = -2.16$). Mean PPBG declined from 224.4 ± 90.6 mg/dL to 129.4 ± 47.3 mg/dL (mean change −95.0 mg/dL; paired $t = -18.7$, $p < 0.001$; Cohen's $d = -1.88$). Linear mixed-effects models estimated a fall in FBG of 7.94 mg/dL per quarterly visit (95% CI: −8.29, −7.60; $p < 0.001$) and in PPBG of 12.78 mg/dL per visit (95% CI: −13.41, −12.14; $p < 0.001$), independent of age and sex. Improvements were observed across all medication-status subgroups, with the largest absolute reductions in participants on continued oral hypoglycaemic therapy.*
Conclusion: *In this single-arm community cohort, FBG and PPBG showed substantial reductions over a 21-month period of yoga-based lifestyle intervention. The absence of a randomised control group and several methodological constraints, including the data provenance issues described in the Limitations section, restrict the inferential strength of these findings. The results are best interpreted as hypothesis-generating and as motivation for a follow-on randomised controlled trial.*

Keywords: type 2 diabetes mellitus; yoga; lifestyle intervention; fasting blood glucose; postprandial blood glucose; observational study; India

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